99/505

WORK STATUS REPORT

JS-508

Period: March 1 through April 30, 1967

MICRODENSITOMETER SUPPORT

by

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May 9, 1967

INTRODUCTION

This progress report covers the period from 1 March through 30 April 1967. The financial information included in this report is for the entire contract period from 2 November 1966 through 31 March 1967.

PROGRESS DURING THE PERIOD

The procurement and assembly of materials and equipment necessary for the basic color microdensitometry experiments have reached the point where the construction of the target exposing equipment is approximately 70% complete. At the same time, the writing, debugging and testing of the required computer programs are also proceeding well. With the present effort continuing into the next period, both the experimental equipment and the programming should be completed on or about June 1.

A tentative sine wave analysis program has been outlined and is presented below. The major effort to implement this program will begin early in the next report period.

The sine wave analysis program can be divided into six phases or subprograms:

1. The exposure of sine waves on type SO-151 (Ektachrome-X) film, using the coherent optical bench. The sine waves will range in frequency from 5.9 cycles/mm to 80 cycles/mm; three levels of modulation will be employed. The sine wave generation will be carried out in each of the three primary colors - the blue and green are provided by conveniently located mercury spectral lines while the red will be provided by a helium/neon laser.

2. Two methods of effective exposure calibration. The first method will simply involve exposure of a daylight-balanced wedge on the film, with calibration being performed with each of the three primary colors. The second method consists of monochromatic exposure of the film, using interference filters that match the laser wavelength or match the interference filters used in the coherent optical bench.

3. The images that are produced will be traced on the Micro-Analyzer, using appropriate interference filters for each layer of the tripack. The traces will then be digitized and analyzed by means of the effective exposure programs currently available at [redacted]

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4. Selected imagery will also be traced on the trichromatic Micro-Analyzer at the customer's facility.

5. An attempt will be made to vary the chromaticity coordinate sinusoidally. This technique will make use of the coherent optical bench and some experi-

mental techniques that, admittedly, are not yet well defined in nature. This technique, if successful, will have the effect of generating Lissajous figures in chromaticity space with distance along the film, rather than time, as the parameter.

6. The imagery generated in item 5 above will be traced with the tricolor Micro-Analyzer. The results of this analysis will be especially valuable in studying layer interactions in effective exposure.

WORK PLANNED FOR NEXT PERIOD

The effort during the next period will be concentrated primarily in the production of sine waves on color film. In particular it is anticipated that Step 1, outlined above, will be completed and some notion of the feasibility of Step 5 will be established.

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FINANCIAL INFORMATION

Total amount authorized	
Total amount expended through March 31, 1967	
Total amount remaining as of March 31, 1967	
Total man-hours expended through March 31, 1967	